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**Unit 1 Test Practice – Short and Long Response: Evolution, Classification, and Origin of Life**

Ms. Ottolini, AP Biology

***Supplementary Resources:*** *See “Ms. Ottolini’s Tips for Answering Long Response Questions” and “Command Terms List” for general guidelines for answering long response questions.*

**Sample Question – Short Response:**

2013

Fossils of lobe-finned fishes, which are ancestors of amphibians, are found in rocks that are at least 380 million

years old. Fossils of the oldest amphibian-like vertebrate animals with true legs and lungs are found in rocks that

are approximately 363 million years old.

Three samples of rocks are available that might contain fossils of a transitional species between lobe-finned

fishes and amphibians: one rock sample that is 350 million years old, one that is 370 million years old, and one

that is 390 million years old.

(a) Select the most appropriate sample of rocks in which to search for a transitional species between lobe-finned

fishes and amphibians. Justify your selection.

(b) Describe TWO pieces of evidence provided by fossils of a transitional species that would support a

hypothesis that amphibians evolved from lobe-finned fishes.

**Sample Question – Long Response:**

2003B

Biologists are interested in preserving the diversity of living organisms on the planet.

a. **Explain** THREEof the following processes or phenomena, using an appropriate example for each.

* mutation
* adaptive radiation
* polyploidy *(Note: we have not talked about this, so you would not use this as an example)*
* population bottlenecks
* growth of the human population *(Note: we have not talked about this, so you would not use this as an example)*

b. For each process or phenomena you selected in (a), **discuss** its impact on the diversity of life on Earth.

2004

Darwin is considered the "father of evolutionary biology." Four of his contributions to the field of evolutionary biology are listed below.

* The non-constancy of species
* Branching evolution, which implies the common descent of all species
* Occurrence of gradual changes in species *(To me, this seems like the first one!)*
* Natural selection as the mechanism for evolution

a. For EACH of the four contributions listed above, **discuss** one example of supporting evidence.

b. Darwin's ideas have been enhanced and modified as new knowledge and technologies have become available. **Discuss** how TWO of the following have modified biologists' interpretation of Darwin's original contributions.

* Hardy-Weinberg equilibrium
* Punctuated equilibrium
* Genetic engineering *(Note: we have not talked about this, so you would not use this as an example)*

2001

Charles Darwin proposed that evolution by natural selection was the basis for the differences that he saw in similar organisms as he traveled and collected specimens in South America and on the Galapagos Islands.

a. **Explain** the theory of evolution by natural selection as presented by Darwin.

b. Each of the following relates to an aspect of evolution by natural selection. **Explain** three of the following.

* Convergent evolution and the similarities among species (ecological equivalents) in a particular biome (e.g., tundra, taiga, ocean, etc.)
* Natural selection and the formation of insecticide-resistant insects or antibiotic resistant bacteria
* Speciation and isolation
* Natural selection and behavior such as kinesis, fixed-action-pattern, dominance hierarchy, etc. *(Note: we have not talked about this, so you would not use this as an example)*
* Natural selection and heterozygote advantage

2010

Phylogeny reflects the evolutionary history of organisms.

(A) **Discuss** TWO mechanisms of speciation that lead to the development of separate species from a common

ancestor.

(B) **Explain** TWO pieces of evidence that have been used to investigate the phylogeny of organisms. **Describe** a

strength or weakness of each method.

(C) The two phylogenetic trees represent the relationship of whales to six other mammals. All of the organisms

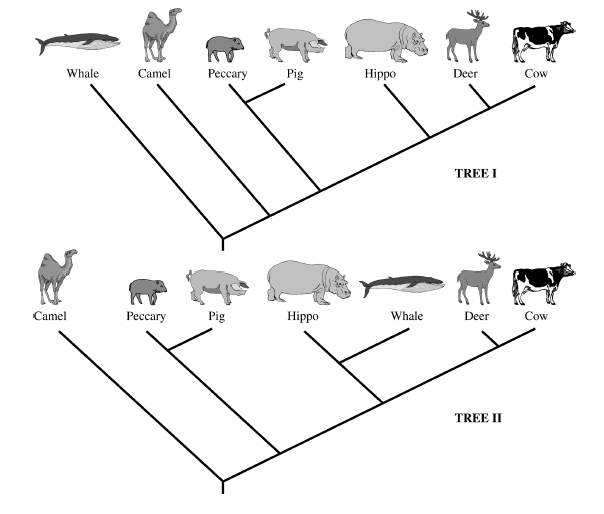
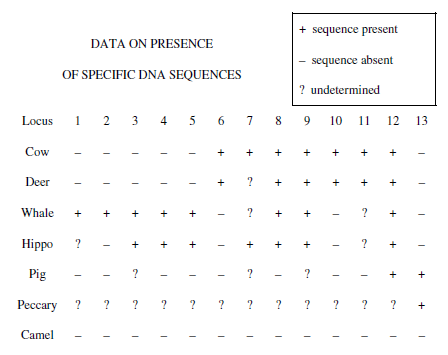
shown have a pulley-shaped astragalus bone in the ankle except for the whale.

• For each tree, **describe** a monophyletic group, the closest relative to the whale, and the point at which

the pulley astragalus was lost or gained.

• Based on the principle of parsimony (the simplest explanation is the best) and the genomic information

in the table shown, **identify** which tree is the best representation of the evolutionary relationship of these animals, and **justify** your answer.



**Scoring – Short Response**

2013 **(Total Points Possible: 4)**

(a) Select the most appropriate sample of rocks in which to search for a transitional species between lobe-finned fishes and amphibians. Justify your selection**. (2 points maximum)**

• Selection: Rocks from 370 MYA sample.

• Justification: Transitional fossils are found between 380 MYA (when lobe-finned fishes lived) and 363 MYA (when amphibians appeared) OR between different strata/layers in the correct order.

(b) Describe TWO pieces of evidence provided by fossils of a transitional species that would support a hypothesis that amphibians evolved from lobe-finned fishes. **(2 points maximum)** Descriptions include but are not limited to the following:

• Bones OR specific skeletal structures like legs /limbs/digits vertebrae flat skulls (interlocking) ribs flexible neck

• Scales

• Teeth

• Other homologous structures

• Has traits of both the lobe-finned fish and the amphibian

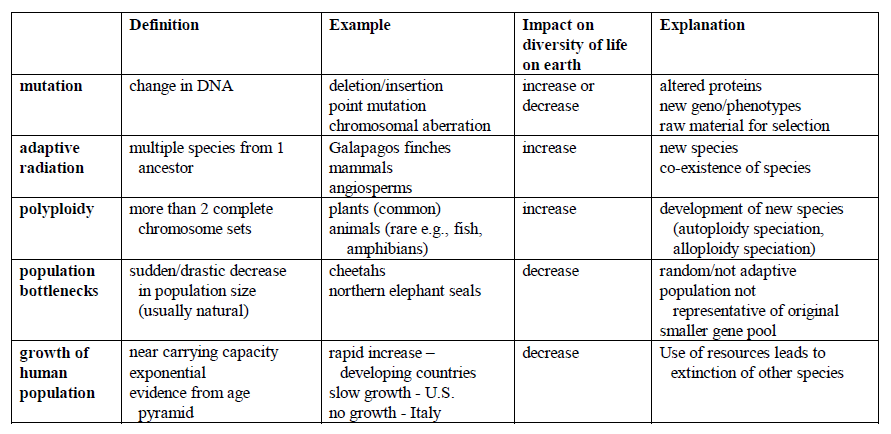
• Finding the transitional fossils in the same area/same environment as either the lobe-finned fish or the amphibian

• Molecular (DNA) evidence

**Scoring – Long Response**

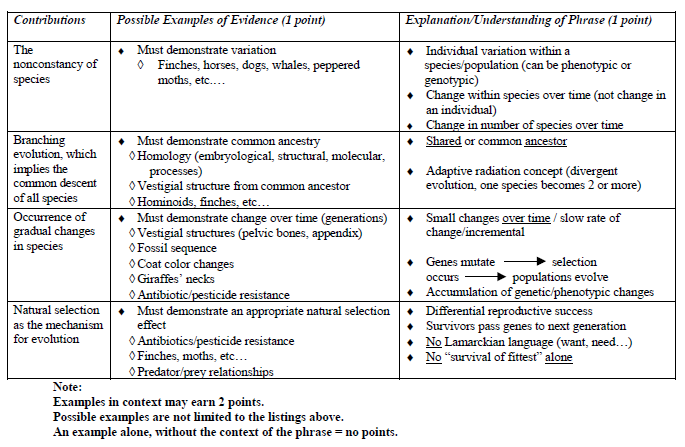
2003B **(Total Points Possible: 12)**

**1 point** for each definition, example, impact, or explanation in the chart below.

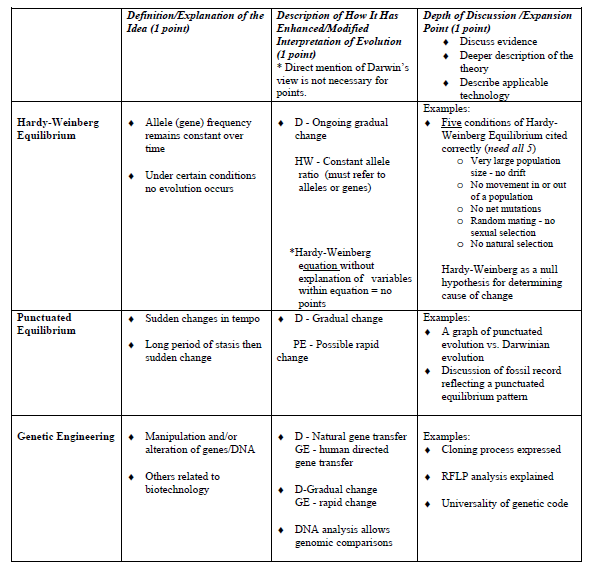


2004 **(Total Points Possible: 12)**

1. For each of the four contributions listed below, discuss one example of supporting evidence. **(2 points each, 8 points maximum)**

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1. Discuss how two of the following have modified biologists’ interpretation of Darwin’s original contribution **(3 points each, 6 points maximum)**

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